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	Revision Date: 26.04.2012
SAFETY DATA SHEET	Print Date: 27.05.2014
Derakane™ 411-45 E epoxy vinyl ester resin ™ Trademark, Ashland or its subsidiaries, registered in various countries 710112	MSDS Number: 000000148855 Version: 1.0

Conforms to EU Regulation 1907/2006/EC as amended. - SDSCLP_GB

1. Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Trade name : Derakane™ 411-45 E
epoxy vinyl ester resin
™ Trademark, Ashland or its subsidiaries, registered in various countries

1.2 Relevant identified uses of the substance or mixture and uses advised against

Use of the Substance/Mixture : Reserved for industrial and professional use.

1.3 Details of the supplier of the safety data sheet

Ashland P.O. Box 8619 NL3009 AP, Rotterdam Netherlands EUSMT@ashland.com	Emergency telephone number 00-800-274-5263-3/001-606-329-5701 , or contact your local emergency telephone number at 112 Product Information +31 10 497 5000 (in the Netherlands), or contact your local CSR contact person
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2. Hazards identification

2.1 Classification of the substance or mixture

Classification (67/548/EEC, 1999/45/EC)

Flammable	R10: Flammable.
Harmful	R20: Harmful by inhalation. R48/20: Harmful: danger of serious damage to health by prolonged exposure through inhalation.
Sensitising	R43: May cause sensitization by skin contact.
Irritant	R36/37/38: Irritating to eyes, respiratory system and skin.

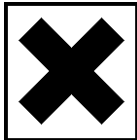
2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

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Labelling according to EC Directives(1999/45/EC)

Hazard symbols :



Harmful

R-phrase(s) : R10 Flammable.
R20 Harmful by inhalation.
R36/37/38 Irritating to eyes, respiratory system and skin.
R43 May cause sensitization by skin contact.
R48/20 Harmful: danger of serious damage to health by prolonged exposure through inhalation.

S-phrase(s) : S16 Keep away from sources of ignition - No smoking.
S23 Do not breathe vapour.
S24 Avoid contact with skin.
S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S37/39 Wear suitable gloves and eye/face protection.
S51 Use only in well-ventilated areas.

Hazardous components which must be listed on the label:

36425-16-8 PHENOL, 4,4'-(1-METHYLETHYLIDENE)BIS-, POLYMER WI
100-42-5 Styrene

2.3 Other hazards

Assessment : PBT substance , vPvB substance - not determined

3. Composition/information on ingredients

3.2 Mixtures

Chemical nature : Static Accumulator

Hazardous components

Chemical Name	CAS-No. EC-No. Registration number	Classification (67/548/EEC)	Classification (REGULATION (EC) No 1272/2008)	Concentration [%]
PHENOL, 4,4'-(1-	36425-16-8	Xi; R43	Skin Sens. 1; H317	>= 50 - < 60

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METHYLETHYLID ENE)BIS-, POLYMER WI				
Styrene	100-42-5 202-851-5 01-2119457861-32-xxxx	R10 Xn; R20 Xi; R36/37/38 Xn; R48/20 Xn; R65	Flam. Liq. 3; H226 Acute Tox. 4; H332 Skin Irrit. 2; H315 Eye Irrit. 2; H319 STOT SE 3; H335 STOT RE 1; H372 Asp. Tox. 1; H304	>= 40 - < 50
Methacrylic acid	79-41-4 201-204-4	Xn; R21/22 C; R35	Acute Tox. 4; H302 Acute Tox. 3; H311 Skin Corr. 1A; H314	>= 0,5 - < 1

For the full text of the R-phrases mentioned in this Section, see Section 16.

For the full text of the H-Statements mentioned in this Section, see Section 16.

4. First aid measures

4.1 Description of first aid measures

- General advice : Consult a physician.
Show this safety data sheet to the doctor in attendance.
- If inhaled : Move to fresh air.
Consult a physician after significant exposure.
If symptoms persist, call a physician.
In case of shortness of breath, give oxygen.
- In case of skin contact : Take off contaminated clothing and shoes immediately.
Wash off immediately with plenty of water.
If skin irritation persists, call a physician.
- In case of eye contact : Hold eyelids apart and flush eyes with plenty of water for at
least 15 minutes. Get medical attention.
Remove contact lenses.
- If swallowed : Do not induce vomiting without medical advice.
Never give anything by mouth to an unconscious person.
Consult a physician if necessary.

4.2 Most important symptoms and effects, both acute and delayed

- Symptoms : Signs and symptoms of exposure to this material through
breathing, swallowing, and/or passage of the material through
the skin may include:
stomach or intestinal upset (nausea, vomiting, diarrhea)

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irritation (nose, throat, airways)
 central nervous system depression (dizziness, drowsiness,
 weakness, fatigue, nausea, headache, unconsciousness) and
 other central nervous system effects
 Lack of coordination
 confusion
 liver damage

Risks : This material is an aspiration hazard. Potential danger from
 aspiration must be weighed against possible oral toxicity (See
 Section 2 - Swallowing) when deciding whether to induce
 vomiting.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment : no data available

5. Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Carbon dioxide (CO₂)
 Dry chemical
 Foam
 Water spray

Unsuitable extinguishing media : Halons
 High volume water jet

5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting : Do not use a solid water stream as it may scatter and spread
 fire.
 Do not allow run-off from fire fighting to enter drains or water
 courses.

Hazardous combustion products : carbon dioxide and carbon monoxide
 toxic fumes
 Hydrocarbons

5.3 Advice for firefighters

Special protective equipment for firefighters : In the event of fire, wear self-contained breathing apparatus.
 Use personal protective equipment.

Further information : Keep containers and surroundings cool with water spray.
 Prevent fire extinguishing water from contaminating surface

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water or the ground water system.
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
For safety reasons in case of fire, cans should be stored separately in closed containments.

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed.
Ensure adequate ventilation.
Pay attention to the spreading of gases especially at ground level (heavier than air) and to the direction of the wind.

6.2 Environmental precautions

Environmental precautions : Prevent further leakage or spillage if safe to do so.

6.3 Methods and materials for containment and cleaning up

Methods for cleaning up : Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).
Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

no data available

7. Handling and storage

7.1 Precautions for safe handling

Advice on safe handling : Avoid formation of aerosol.
Do not breathe vapours or spray mist.
Avoid contact with skin and eyes.
For personal protection see section 8.
Provide sufficient air exchange and/or exhaust in work rooms.
Avoid exceeding of the given occupational exposure limits (see section 8).
Smoking, eating and drinking should be prohibited in the application area.
Ensure all equipment is electrically grounded before beginning transfer operations.

Advice on protection against fire and explosion : Take measures to prevent the build up of electrostatic charge.
Mixture may charge electrostatically: always use earthing

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leads when transferring from one container to another.
Keep product and empty container away from heat and sources of ignition.
No sparking tools should be used.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers : Store in original container.
Keep containers tightly closed in a dry, cool and well-ventilated place.
Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Other data : Stable under recommended storage conditions.

7.3 Specific end uses

8. Exposure controls/personal protection

8.1 Control parameters

Components	CAS-No.	Value type	Form of Exposure	Control parameters	Update	Basis
Styrene	100-42-5	TWA		100 ppm 430 mg/m ³	2007	EH40 WEL
Styrene	100-42-5	STEL		250 ppm 1.080 mg/m ³	2007	EH40 WEL
Methacrylic acid	79-41-4	TWA		20 ppm 72 mg/m ³	2007	EH40 WEL
Methacrylic acid	79-41-4	STEL		40 ppm 143 mg/m ³	2007	EH40 WEL

DNEL
Styrene : End Use: Workers
Exposure routes: Inhalation
Potential health effects: Short-term exposure, Systemic effects
Value: 289 mg/m³

Styrene : End Use: Workers
Exposure routes: Inhalation
Potential health effects: Short-term exposure, Local effects
Value: 306 mg/m³

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- Styrene : End Use: Workers
Exposure routes: Inhalation
Potential health effects: Long-term exposure, Systemic effects
Value: 85 mg/m3
- Styrene : End Use: Workers
Exposure routes: Skin contact
Potential health effects: Long-term exposure, Systemic effects
Value: 406 mg/kg
- Styrene : End Use: Consumers
Exposure routes: Inhalation
Potential health effects: Short-term exposure, Systemic effects
Value: 174,25 mg/m3
- Styrene : End Use: Consumers
Exposure routes: Inhalation
Potential health effects: Short-term exposure, Local effects
Value: 182,75 mg/m3
- Styrene : End Use: Consumers
Exposure routes: Skin contact
Potential health effects: Long-term exposure, Systemic effects
Value: 343 mg/kg
- Styrene : End Use: Consumers
Exposure routes: Ingestion
Potential health effects: Long-term exposure, Systemic effects
Value: 2,1 mg/kg
- Styrene : End Use: Consumers
Exposure routes: Inhalation
Potential health effects: Long-term exposure, Systemic effects
Value: 10,2 mg/m3

8.2 Exposure controls

Engineering measures

Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below level of overexposure (from known, suspected or apparent adverse effects).

Personal protective equipment

Respiratory protection : In the case of vapour formation use a respirator with an approved filter.
When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

Eye protection : Safety glasses with side-shields

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- Skin and body protection : Wear as appropriate:
Safety shoes
Flame-resistant clothing
polyvinyl alcohol
- Hygiene measures : Keep away from food, drink and animal feedingstuffs.
When using do not eat, drink or smoke.
Ensure that eyewash stations and safety showers are close to
the workstation location.

Environmental exposure controls

- General advice : Prevent further leakage or spillage if safe to do so.

9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

- Appearance : liquid
- Colour : no data available
- Odour : no data available
- Odour Threshold : no data available
- pH : no data available
- Freezing point / Melting point : no data available
- Boiling point : 145 °C; Calculated Phase Transition Liquid/Gas
- Flash point : 29,4 °C; Seta closed cup
- Evaporation rate : no data available
- Flammability (solid, gas) : no data available
- Burning rate : no data available
- Lower explosion limit : 1 %(V); GLP: Calculated Explosive Limit
- Upper explosion limit : 6 %(V); GLP: Calculated Explosive Limit
- Vapour pressure : 8,53248 hPa; 25 °C; Calculated Vapor Pressure
- Relative vapour density : no data available
- Relative density : no data available

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Density : 1,078 g/cm³; 25 °C

Water solubility : insoluble

Solubility in other solvents : no data available

Partition coefficient: n-octanol/water : no data available

Autoignition temperature : no data available

Ignition temperature : no data available

Thermal decomposition : no data available

Viscosity, dynamic : no data available

Viscosity, kinematic : > 20,5 mm²/s; 40 °C

Explosive properties : no data available

Oxidizing properties : no data available

9.2 Other information

Conductivity : no data available

Oxidising potential : no data available

Refractive index : no data available

Glowing Temperature : no data available

Burning number : no data available

Molecular Weight : no data available

Sublimation point : no data available

Bulk density : no data available

Flow time : no data available

Impact Sensitivity : no data available

Surface tension : no data available

10. Stability and reactivity

10.1 Reactivity

Hazardous polymerisation may occur.

10.2 Chemical stability

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Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

Hazardous reactions : Further information: Stable under recommended storage conditions.

: Hazardous polymerisation may occur.
Vapours may form explosive mixture with air.

10.4 Conditions to avoid

Conditions to avoid : Exposure to sunlight.
Exposure to air.

Heat, flames and sparks.

10.5 Incompatible materials

Materials to avoid : Acids
alkalis
aluminum
aluminum chloride
Bases
Copper
Copper alloys
halogens
iron chloride
metal salts
Strong oxidizing agents

10.6 Hazardous decomposition products

Hazardous decomposition products : carbon dioxide and carbon monoxide
toxic fumes
Hydrocarbons

11. Toxicological information

11.1 Information on toxicological effects

Product

Acute oral toxicity : no data available

Acute inhalation toxicity : no data available

Acute dermal toxicity : no data available

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Acute toxicity (other routes of administration) : no data available

Skin corrosion/irritation : no data available

Serious eye damage/eye irritation : no data available

Respiratory or skin sensitization : no data available

STOT - repeated exposure : Target Organs: Overexposure to this material (or its components) has been suggested as a cause of the following effects in laboratory animals: liver damage, Overexposure to this material (or its components) has been suggested as a cause of the following effects in humans: mild effects on color vision, effects on hearing, respiratory tract damage (nose, throat, and airways), central nervous system effects

Components:

Styrene :

Acute oral toxicity : LD 50: 2.650 mg/kg, Rat

Acute inhalation toxicity : LC 50: 2800 ppm, 4 h, Rat,

STOT - single exposure : Assessment: May cause respiratory irritation.

Further information : Central Nervous System

Methacrylic acid :

Acute oral toxicity : LD 50: 1.320 mg/kg, Rat(male), OECD Test Guideline 401

Acute inhalation toxicity : LD 50: 7,1 mg/l, 4 h, Rat, Aerosol

Acute dermal toxicity : LD 50: 500 mg/kg, Rabbit

12. Ecological information

12.1 Toxicity

Product:

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no data available

Components:

Styrene:

Toxicity to fish : LC 50: 4,02 mg/l, 96 h, Pimephales promelas (fathead minnow)

Toxicity to daphnia and other aquatic invertebrates. : EC 50: 4,7 mg/l, 48 h, Water flea (Daphnia magna)

Toxicity to algae : EC 50: > 4,9 mg/l, 72 h, Pseudokirchneriella subcapitata (green algae)

Toxicity to bacteria : EC 50: ca. 500 mg/l, 0,5 h, activated sludge

Toxicity to daphnia and other aquatic invertebrates. (Chronic toxicity) : NOEC: 1,01 mg/l, 21 d, Water flea (Daphnia magna)

12.2 Persistence and degradability

Product:

no data available

Components:

Styrene :

Biodegradability : Readily biodegradable

12.3 Bioaccumulative potential

Product:

Bioaccumulation : The bioaccumulation potential cannot be determined.

Components:

no data available

12.4 Mobility in soil

Product:

no data available

Components:

no data available

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12.5 Results of PBT and vPvB assessment

Product:

no data available

Components:

no data available

12.6 Other adverse effects

Product:

no data available

Components:

no data available

13. Disposal considerations

13.1 Waste treatment methods

- Product : Dispose of in accordance with the European Directives on waste and hazardous waste.
- : Do not contaminate ponds, waterways or ditches with chemical or used container.
Container hazardous when empty.
Dispose of in accordance with local regulations.
- Contaminated packaging : Empty remaining contents.
Dispose of as unused product.
Empty containers should be taken to an approved waste handling site for recycling or disposal.
Do not re-use empty containers.
Do not burn, or use a cutting torch on, the empty drum.

14. Transport information

REGULATION

ID NUMBER	PROPER SHIPPING NAME	*HAZARD CLASS	SUBSIDIARY HAZARDS	PACKING GROUP	MARINE POLLUTANT / LTD. QTY.
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ADR

UN	1866	RESIN SOLUTION	3	III	
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ADNR

UN	1866	RESIN SOLUTION	3	III
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RID

UN	1866	RESIN SOLUTION	3	III
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INTERNATIONAL MARITIME DANGEROUS GOODS

UN	1866	RESIN SOLUTION	3	III
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INTERNATIONAL AIR TRANSPORT ASSOCIATION - CARGO

UN	1866	Resin solution	3	III
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INTERNATIONAL AIR TRANSPORT ASSOCIATION - PASSENGER

UN	1866	Resin solution	3	III
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*ORM = ORM-D, CBL = COMBUSTIBLE LIQUID

Dangerous goods descriptions (if indicated above) may not reflect quantity, end-use or region-specific exceptions that can be applied. Consult shipping documents for descriptions that are specific to the shipment.

15. Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Notification status

US. Toxic Substances Control Act	y (positive listing)
Canada. Canadian Environmental Protection Act (CEPA). Domestic Substances List (DSL). (Can. Gaz. Part II, Vol. 133)	q (quantity restricted)
Australia. Industrial Chemical (Notification and Assessment) Act	y (positive listing)
New Zealand. Inventory of Chemicals (NZIoC), as published by ERMA New Zealand	n (Negative listing)
Japan. Kashin-Hou Law List	y (positive listing)
Korea. Toxic Chemical Control Law (TCCL) List	n (Negative listing)
Philippines. The Toxic Substances and Hazardous and Nuclear Waste Control Act	n (Negative listing)
China. Inventory of Existing Chemical Substances	y (positive listing)

15.2 Chemical Safety Assessment

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16. Other information

Full text of R-phrases referred to under sections 2 and 3

R10	Flammable.
R20	Harmful by inhalation.
R21/22	Harmful in contact with skin and if swallowed.
R35	Causes severe burns.
R36/37/38	Irritating to eyes, respiratory system and skin.
R43	May cause sensitization by skin contact.
R48/20	Harmful: danger of serious damage to health by prolonged exposure through inhalation.
R65	Harmful: may cause lung damage if swallowed.

Full text of H-Statements referred to under sections 2 and 3.

H226	Flammable liquid and vapour.
H302	Harmful if swallowed.
H304	May be fatal if swallowed and enters airways.
H311	Toxic in contact with skin.
H314	Causes severe skin burns and eye damage.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H372	Causes damage to organs through prolonged or repeated exposure if inhaled.

Further information

Other information : The information accumulated herein is believed to be accurate but is not warranted to be whether originating with the company or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances. This SDS has been prepared by Ashland's Environmental Health and Safety Department (+31 10 497 5000).

List of abbreviations and acronyms that could be, but not necessarily are, used in this safety data sheet :

ABM : Water Hazard Class for the Netherlands
ADR : Agreement concerning the International Carriage of Dangerous Goods by Road.
CAS : Chemical Abstracts Service (Division of the American Chemical Society).
CLP : Classification, Labeling, Packaging
CMR : Carcinogen, Mutagen or Reproductive Toxicant
CSA : Chemical Safety Assessment
CSR : Chemical Safety Report
DNEL : Derived No Effect Level.
EINECS : European Inventory of Existing Commercial Chemical Substances.
ELINCS : European List of notified Chemical Substances
FG : Food grade

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GHS : Globally Harmonized System of Classification and Labeling of Chemicals.
 IATA : International Air Transport Association.
 IATA-DGR : Dangerous Goods Regulation by the "International Air Transport Association" (IATA).
 ICAO : International Civil Aviation Organization
 ICAO-TI
 (ICAO) : Technical Instructions by the "International Civil Aviation Organization"
 IMDG : International Maritime Code for Dangerous Goods
 logPow : octanol-water partition coefficient
 LCxx : Lethal Concentration, for xx percent of test population
 LDxx : Lethal Dose, for xx percent of test population.
 ICxx : Inhibitory Concentration for xx of a substance
 Ecxx : Effective Concentration of xx
 OECD : Organization for Economic Co-operation and Development
 OELs : Occupational Exposure Limits
 PBT : Persistent , Bioaccumulative and Toxic
 PEC : Predicted Effect Concentration
 PEL : Permissible Exposure Limits
 PNEC : Predicted No Effect Concentration
 PPE : Personal Protection Equipment
 REACH : Registration, Evaluation, Authorisation and Restriction of Chemical substances
 RID : Regulation Concerning the International Transport of Dangerous Goods by Rail
 STEL : Short-term exposure limit
 STOT : Specific Target Organ Toxicity
 TLVs : Threshold Limit Values
 TWA : Time-weighted average
 vPvB : Very Persistent and Very Bioaccumulative
 WEL : Workplace Exposure Level
 WGK : German Water Hazard Class
 P-Statement : Precautionary Statement
 R-phrase : Risk phrase
 H-statement : Hazard Statement